

What is claimed is:

1. A power supply apparatus comprising:

a circuit that produces from an input voltage an output voltage within a predetermined permissible variation range; and

a circuit that, as an output current increases, decreases a target level of the output voltage within the permissible variation range.

2. A power supply apparatus comprising:

an output current detector that produces a monitoring voltage commensurate with an output current;

a comparator that changes an output level thereof according to whether or not the monitoring voltage is higher than a predetermined threshold level;

an output controller that controls an output voltage based on an output signal from the comparator;

an offsetter that gives the monitoring voltage an offset; and

an output voltage comparator that controls a magnitude of the offset according to a result of comparison between the output voltage and a predetermined reference voltage,

wherein the output voltage comparator, in producing from an input voltage the output voltage within a predetermined permissible variation range, controls the magnitude of the offset in such a way that, as the output current increases, the output voltage decreases within the permissible variation range.

3. A power supply apparatus as claimed in claim 2,

wherein the output voltage comparator includes:

an operational amplifier that operates so as to make the output voltage and the reference voltage equal; and

a constant-impedance controller that controls the magnitude of the offset according to an output terminal voltage of the operational amplifier and that produces a signal by which a target level of the output voltage is reduced within the permissible variation range as the output current increases.

4. A power supply apparatus as claimed in claim 3,

wherein the constant-impedance controller includes:

a first resistor connected between one input terminal of the operational amplifier to which the output voltage is applied and an output terminal of the operational amplifier; and

a second resistor connected between the one input terminal of the operational amplifier to which the output voltage is applied and a terminal to which the output voltage is applied, and

wherein, by producing a voltage difference commensurate with an increase or decrease in the output current across the first resistor between a voltage at the one input terminal of the operational amplifier and the voltage at the output terminal thereof, a current that flows from the first resistor to the second resistor is varied.

5. A power supply apparatus as claimed in claim 4,

wherein the constant-impedance controller uses the reference voltages as a

current setting reference voltage with reference to which the constant-impedance controller determines correlation between the voltage at the output terminal of the operational amplifier and the magnitude of the offset.

6. A power supply apparatus as claimed in claim 2,

wherein the output voltage comparator includes:

an amplifier that amplifies a differential voltage between the output voltage and a first reference voltage;

a pair of resistors that are serially connected between two different potentials so as to bias the voltage amplified by the amplifier; and

a voltage-to-current converter that converts the amplified and then biased voltage into a current to produce a setting signal by which the magnitude of the offset is set.

7. A power supply apparatus as claimed in claim 1,

wherein the target level of the output voltage is decreased at a fixed ratio.

8. A power supply apparatus as claimed in claim 1,

wherein, when the output current abruptly increases, the output voltage is kept at a decreased voltage level.

9. A power supply apparatus as claimed in claim 2,

wherein the output controller includes:

a pair of output transistors connected in series between two different

potentials so as to act as switching devices, the output voltage being derived from a node between the output transistors;

a flip-flop that receives, at a reset terminal thereof, the output signal of the comparator and that receives, at a set terminal thereof, a clock signal having a predetermined frequency; and

an output transistor drive circuit that drives the pair of output transistors according to an output signal of the flip-flop.

10. A power supply apparatus as claimed in claim 2,

wherein the output controller includes:

an output transistor connected directly between an input terminal via which the input voltage is fed in and an output terminal via which the output voltage is fed out, the output transistor being turned on and off according to the output signal of the comparator.